OVARIAN CANCER

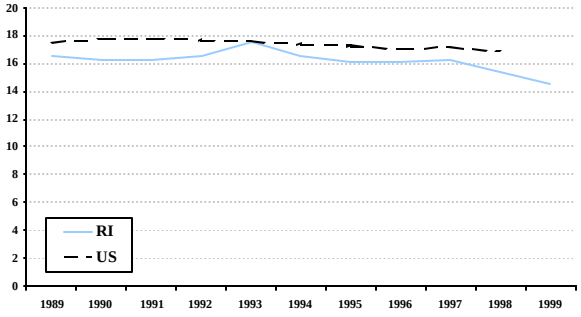
Ovarian cancer originates in the inner tissues or outer lining of the ovaries, or female reproductive organs. Ovarian cancer can be divided into three categories: epithelial carcinoma, germ cell cancer, and stromal cancer. Epithelial carcinomas are tumors that originate in the epithelial cells that form the lining of the ovaries; it is the most common type of ovarian cancer. Germ cell cancer originates in the cells that are to become the egg cells that are released each month from the ovary. It is not common (only about 5% of ovarian cancer cases) and is usually found in younger women. Stromal cell cancer originates in the cells that make up the tissues that hold the ovary together; it also accounts for only about 5% of ovarian cancer cases. (RICAN)

Ovarian cancer is the sixth most commonly diagnosed cancer among RI females (annual average of 88 newly diagnosed cases in each of the five years 1997-2001), and accounted for less than 2% of newly diagnosed cancers in 1997-2001, including both males and females. Ovarian cancer is the fifth leading cause of cancer death among RI females (annual average of 57 deaths in each of the five years 1996-2000), and accounted for just over 2% of all cancer deaths in 1996-2000, including both males and females. In Rhode Island, approximately 689 females alive today were diagnosed with ovarian cancer at some point in the past 25 years (2000). (RICR)

Cancer Rates

Figure 12-1. Ovarian cancer incidence by year

Average annual invasive ovarian cancer incidence rates** by year among females, RI and US, 1987-2001***.*

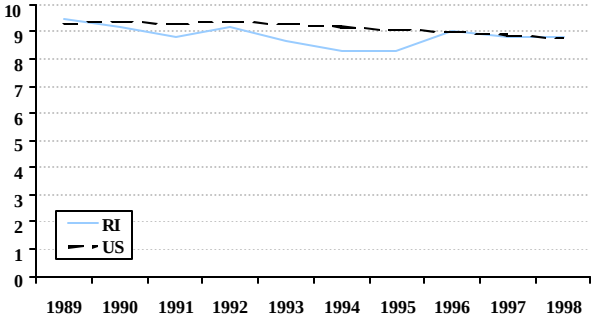


* Invasive includes the following stages of disease at diagnosis: local, regional, distant, and unknown.
** Rates are age-adjusted to the year 2000 US standard population, expressed as cases per 100,000 population.
*** Rates are five-year moving averages.
Source: RICR, HEALTH; SEER Public-Use 1973-2000 Data; calculated with *SEER*Stat*.

The age-adjusted incidence of invasive ovarian cancer among RI females of all races was around 16.5 cases per 100,000 females from 1989 to 1993, then decreased to 14.5 cases per 100,000 in 1999 (based on five-year moving averages). The age-adjusted incidence of invasive ovarian cancer among US females of all races may show signs of a small decline (from 17.8 cases per 100,000 females in 1990 to 16.9 cases per 100,000 in 1998; based on five-year moving averages).

Figure 12-2. Ovarian cancer mortality by year

Average annual ovarian cancer mortality rates by year among females, RI and US, 1987-2000***.

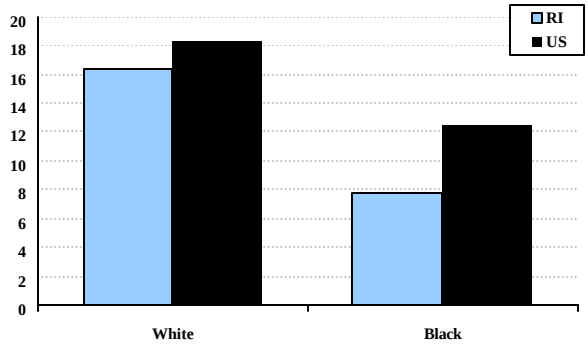


* Rates are age-adjusted to the year 2000 US standard population, expressed as deaths per 100,000 population.
** Rates are five-year moving averages.
Source: Office of Vital Records, HEALTH; SEER US Mortality 1969-2000 Data; calculated with *SEER*Stat*.

The age-adjusted mortality of invasive ovarian cancer among RI females of all races hovered around 9 deaths per 100,000 females for the entire period of observation (based on five-year moving averages). The age-adjusted mortality of invasive ovarian cancer among US females of all races may have experienced a small but steady decline from 9.4 deaths per 100,000 females in 1992 to 8.8 deaths per 100,000 females in 1998 (based on five-year moving averages).

Figure 12-3. Ovarian cancer incidence by race

Average annual invasive ovarian cancer incidence rates by race among females, RI and US, 1987-2000.*



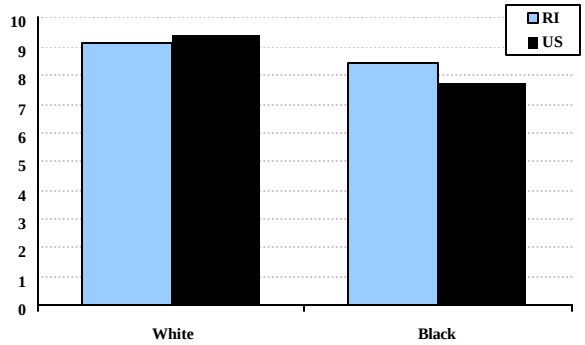
* Rates are age-adjusted to the year 2000 US standard population, expressed as cases per 100,000 population.
Source: RICR, HEALTH; SEER Public-Use 1973-2000 Data; calculated with *SEER*Stat*.

In 1987-2000, ovarian cancer incidence rates in RI were higher among white females (16 cases per 100,000) than black females (8 cases per 100,000). US female rates were also higher among white females (18 cases per 100,000) than black females (12 cases per 100,000).

[Note: RI incidence data for 2001 is currently available. US incidence data is only available through 2000. For comparability, the figure at left contains RI data through 2000.]

Figure 12-4. Ovarian cancer mortality by race

Average annual ovarian cancer mortality rates by race among females, RI and US, 1987-2000.*



* Rates are age-adjusted to the year 2000 US standard population, expressed as deaths per 100,000 population.
Source: Office of Vital Records, HEALTH; SEER US Mortality 1969-2000 Data; calculated with *SEER*Stat*.

In 1987-2000, ovarian cancer mortality rates in RI were slightly higher among white females (9 deaths per 100,000) than black females (8 deaths per 100,000). US female rates were also slightly higher among white females.

Risk Factors

Important risk factors for ovarian cancer include older age (females over age 60), low parity, and family history of ovarian cancer. (Clinical) Factors that may be associated with decreased risk include use of oral contraceptives, childbearing and breast-feeding, tubal ligation, and hysterectomy. (NCI summaries)

Prevention

There are currently no known preventives for ovarian cancer. However, control strategies include risk education and effective evaluation of risk among all women.

Screening

Screening tests for ovarian cancer include pelvic examination, Pap test, ultrasound, and measurement of serum tumor markers. (Clinical) Currently, screening tests have not been found effective in the reduction of morbidity or mortality from ovarian cancer, and most organizations do not recommend routine screening of asymptomatic women. (Clinical) The American College of Physicians does recommend counseling high-risk women about the potential benefits and harms of ovarian cancer screening. (Clinical)

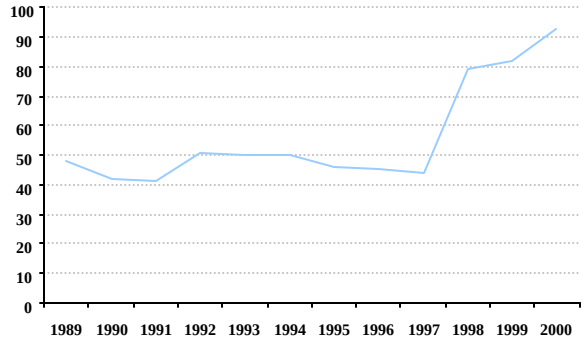
Treatment

The goal of treatment for ovarian cancer is to remove, destroy, or control the tumor and its ability to spread. Several factors, such as the patient's stage of life, general health, size and location of tumors, and personal feelings, are taken into consideration when deciding what treatment option is right for a patient. Surgical treatment for ovarian cancer is typically performed after diagnosis as treatment, however, in cases of very high risk, surgery may occur before diagnosis as a preventative measure. The following surgical procedures may be used in very high-risk situations: tubal ligation, oophorectomy, and hysterectomy. The following surgical procedures may be used as treatment after diagnosis: oophorectomy, hysterectomy, and debulking. Non-surgical treatment options include chemotherapy (pill form, intravenous injections, or intraperitoneally), radiation therapy, biological therapy, and clinical trials. (RICAN)

The percent of ovarian cancer cases in RI ACOS-approved treatment programs and the percent staged with AJCC staging methodology is detailed below.

Figure 12-5. Ovarian cancer in ACOS programs by year

Percent of ovarian cancer cases that were or are treated in ACOS approved cancer treatment programs by year among females, RI, 1989-2000.

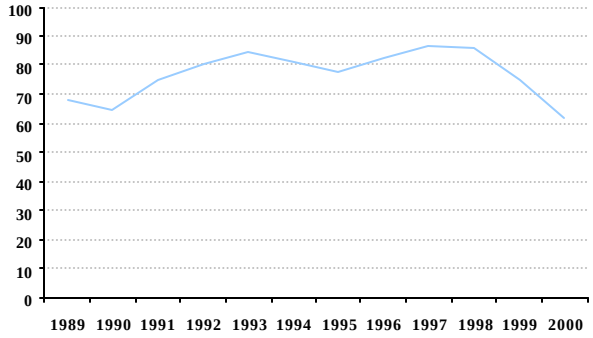


Source: RICR, HEALTH

The percent of ovarian cancer case reports from ACOS approved hospital cancer treatment programs in RI varied between 40-50% from 1989 to 1997, increased dramatically to 79% in 1998 and then to 93% in 2000.

Figure 12-6. Ovarian cancer with AJCC staging by year

Percent of ovarian cancer cases staged with AJCC staging methodology by year among females, RI, 1989-2000.

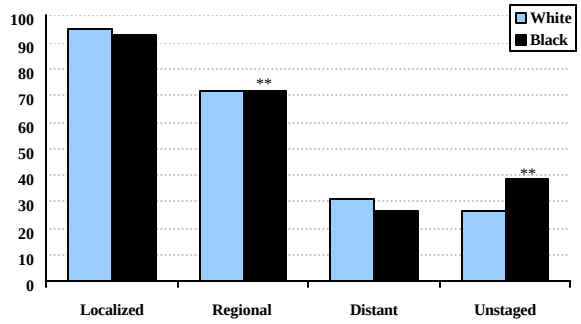


Source: RICR, HEALTH

The proportion of diagnosed ovarian cancer cases staged using the AJCC system increased from 68% in 1990 to 92% in 1998, then decreased to 67% in 2000.

Survival

Figure 12-7. Ovarian cancer survival rates by race and stage
Five year relative invasive ovarian cancer survival rates by race and stage of disease at diagnosis among females, US, 1992-1999.*



* Survival rates are relative rates expressed as percents.
** The standard error of the survival rate is between 5 and 10 percentage points.
Source: *SEER Cancer Statistics Review, 1975-2000.*

Based on US data from 1992-1999, five-year relative survival rates for ovarian cancer are higher when diagnosed at earlier stages of disease. Ovarian cancers diagnosed while localized have a five-year survival rate of 95% among white females and 93% among black females. Cancers that are not diagnosed until a distant stage have a five-year survival rate of 31% among whites and 26% among blacks. Five-year survival rates are slightly higher among whites than blacks for ovarian cancers diagnosed while localized or distant, and are similar among whites and blacks for those diagnosed while regional.

Discussion

Summary of Burden

Although the annual number of new ovarian tumors diagnosed in Rhode Island is relatively small, the burden is significant because the case-fatality of ovarian cancer, except when diagnosed at the earliest stage of disease, is high.

For example, the five-year survival rate for women diagnosed with localized ovarian cancer is about 94%, while the survival rate among women diagnosed with distant ovarian cancer is about 28%.

The incidence of ovarian cancer in Rhode Island may have started to decline in the late 1990's.

The reason for this decline is unknown.

Relative Burden

The burden of ovarian cancer is slightly less in Rhode Island than in the nation as a whole.

Both incidence and mortality were slightly lower in Rhode Island than in the United States as a whole in the 1990's, although both followed a similar trend.

Disparities

In Rhode Island, white women are about twice as likely as black women to be diagnosed with ovarian cancer.

A similar (but slightly smaller) differential is seen at the national level.

Status of Control Strategies

The burden of ovarian cancer may be reduced by increasing women's awareness of risk factors for ovarian cancer, by increasing the proportion of women who have evaluated their risk, by assuring state-of-the-art gynecological care for high-risk women, and by assuring state-of-the-art treatment for all ovarian cancer patients.

At the present time, the proportion of adult women in Rhode Island who have evaluated their risk is unknown because this issue has not been a focus of statewide surveys from which we normally derive such data.

By the year 2000, 9 out of 10 ovarian cancer case reports in Rhode Island were from American College of Surgeons (ACOS) approved hospitals.

In Rhode Island, the proportion of ovarian tumors staged with American Joint Committee on Cancer (AJCC) methodology increased from 73% in 1989 to 92% in 1998, then decreased to 67% in 2000. The decrease is under investigation, as it is a potential cause for concern. Rhode Island Cancer Registry staff have ascertained that the decrease is not a computational error, have identified the sources of case reports with "unknown" AJCC stage, and are in communication about this problem with the relevant institutional cancer registries.

Cancer Control Priorities for 2004

Reduce the burden of ovarian cancer by promoting awareness of risk factors and by promoting evaluation of risk.

Use promotion techniques to increase the proportion of Rhode Islanders who are aware of important risk factors for ovarian cancer, such as older age and family history of ovarian cancer, and who have evaluated their level of risk.

Reduce the burden of ovarian cancer by increasing the proportion of ovarian cancer patients who receive state-of-the-art treatment.

Monitor the literature on the effectiveness of ovarian cancer screening tests.

Current research does not support the use of screening tests for ovarian cancer, but new approaches to ovarian cancer screening are under development and should be monitored for effectiveness.

Begin to eliminate disparities by identifying reasons for disparities in relative mortality.

Identify reasons for race disparities in ovarian cancer incidence, using data from the Rhode Island Cancer Registry, the Behavioral Risk Factor Surveillance System, and the Rhode Island Health Interview Survey.